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(54) COMMUNICATION DEVICE AND COMMUNICATION METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To smooth communication between a transmitting side and a receiving side.

SOLUTION: A transmitting part 11 and a receiving part 13 are provided to communicate communication information 12 including transmission information (audio and image information including a heart rate, a body temperature and the like) from an operator. An organism information (environmental physical information) processing part 14 is provided to estimate the psychology and physiological state of the operator from the communicated communication information 12 and output them as estimators.

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CLAIMS

[Claim(s)]

[Claim 1] The communication device characterized by having the transmitting section for communicating communication link information including the transfer information from an operator and a receive section, and the presumed section that presumes an operator's psychology and physiology condition based on the communication link information which communicates, and is outputted as estimate.

[Claim 2] Transfer information is a communication device according to claim 1 characterized by including speech information.

[Claim 3] Transfer information is a communication device according to claim 1 or 2 characterized by including image information.

[Claim 4] It is a communication device given in claim 1 thru/or any of 3 have further the vital sign measurement section which measures an operator's vital signs, such as a heart rate, as vital sign information, and they are. [which is characterized by communication link information including vital sign information]

[Claim 5] It is a communication device given in claim 1 thru/or any of 4 have the body of a communication device which contains either [at least] the transmitting section or a receive section, and they are. [which is characterized by preparing the vital sign measurement section in the part which can contact the operator in the body of a communication device]

[Claim 6] Furthermore, it is a communication device given in claim 1 thru/or any of 5 have the environmental measurement section which measures the physical information on a circumference environment, and they are. [which is characterized by communication link information including the above-mentioned physical information]

[Claim 7] Furthermore, it is a communication device given in claim 1 thru/or any of 6 when it has the storage section which memorizes an operator's individual humanity news and social information and the presumed section presumes estimate based on communication link information, they are. [which is characterized by using an operator's individual humanity news and social information]

[Claim 8] The presumed section is a communication device given in claim 1 thru/or any of 7 they are. [which is characterized by being what has for estimate remaining as it is or the function which is processed and is outputted in a receiving side]

[Claim 9] The presumed section is a communication device given in claim 1 thru/or any of 8 they are. [which is characterized by being what has for estimate remaining as it is or the function which is processed and is outputted in a transmitting side]

[Claim 10] The presumed section is a communication device according to claim

8 or 9 characterized by expressing the feeling of an operator's joy, anger, humor and pathos based on an operator's psychology and physiology condition which were acquired, and outputting.

[Claim 11] The presumed section is a communication device given in claim 8 thru/or any of 10 they are. [which is characterized by outputting estimate with processing gestalten, such as expression of a table, a graph or a graphic form, or a face, and a color,]

[Claim 12] It is a communication device given in claim 8 thru/or any of 11 have the display which displays the image information contained in communication link information, and the presumed section is. [which is characterized for estimate by the above-mentioned image information, a juxtaposition, or making it pile each other up and displaying in the above-mentioned display]

[Claim 13] A communication device given in claim 1 thru/or any of 12 they are. [which is characterized by having the selection section which chooses authorization of transmission of communication link information, or reception, disapproval or authorization of an output, and disapproval by either / at least / the transmitting side or the receiving side]

[Claim 14] A communication device given in claim 1 thru/or any of 13 they are. [which is characterized by having the conversion section to which transfer information is changed based on estimate]

[Claim 15] The correspondence procedure characterized by presuming and outputting an operator's psychology and physiology condition based on the above-mentioned communication link information when an operator communicates using communication link information including the transfer information from an operator.

[Claim 16] The correspondence procedure according to claim 15 characterized by memorizing an operator's individual humanity news and social information, also taking into consideration an operator's individual humanity news and social information, and presuming and outputting an operator's psychology and physiology condition.

[Claim 17] The correspondence procedure according to claim 15 or 16 characterized by measuring the vital sign information of operators, such as a heart rate, adding the above-mentioned vital sign information to communication link information, and communicating.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the communication device and correspondence procedure which can be carried out smoothly in the communication link of the information between a transmitting side and a receiving side.

[0002]

[Description of the Prior Art] In communication devices, such as the conventional cellular phone and facsimile, the information transmitted and received has four kinds of data, speech information, text, image information, and software information, in use. The situation did not change in any communication link infrastructures, for example, the Internet. And emphasis was put on reproducing the transmitted information faithfully.

[0003] However, with the above conventional techniques, since the information transmitted and received had only carried out it having been restricted to intentional information, such as speech information, text, image information, and software information, upwards, and reproducing information faithfully by the receiving side, a receiving side was not able to be pulled out from the information which communicated the value beyond the intention of a transmitting side.

[0004] Then, the medical-application communication device which can transmit biological information, such as an electrocardio signal, with a sound signal is indicated by JP,5-228117,A. Moreover, body sensory information, such as

temperature, is transmitted with a sound signal, and the information communication link telephone equipment which restores the above-mentioned body sensory information in a receiving side is indicated by JP,1-162069,A.

[0005]

[Problem(s) to be Solved by the Invention] however, since [above] each **, with the technique of an official report, since biological information and body sensory information are only reproduced or restored as it is, it is difficult to grasp the feeling of a transmitting side, and a surrounding environment condition from the above-mentioned biological information or body sensory information, it is delayed, and it has had the problem that trouble may arise in the communication link (communication) between a transmitting side and a receiving side.

[0006] moreover, since each above-mentioned **, in a gazette, it does not take into consideration at all about a transmitting side grasping the environment condition of feeling change of a transmitting side, or a perimeter, but has had the problem that trouble may arise in the communication link (communication) between a transmitting side and a receiving side, also in the transmitting side.

[0007] Then, the information which transmitting sides also including speech information meant the purpose of this invention, and was sent, To the biological information (vital sign information) obtained from the information observed by the measurement section provided in the communication device of a transmitting

side and the physical information on environmental, and a pan The information about the transmitting side already registered by the receiving side or a receiving side etc. is taken into consideration. Psychology, such as a situation of having occurred from there in the temper and feeling (joy, anger, humor and pathos) of a transmitting side, health condition, and a perimeter, a physiology condition The physical condition of a circumference environment is computed and presumed positively. Or a numeric value, drawing, a picture, etc., Or it is offering the communication device and correspondence procedure which show by display what piled up the image of them and a transmitting side as opposed to a receiving side (to or transmitting side), and can communicate more exactly.

[0008]

[Means for Solving the Problem] The communication device of this invention is characterized by having the transmitting section for communicating communication link information including the transfer information from an operator and a receive section, and the presumed section that presumes an operator's psychology and physiology condition based on the communication link information which communicates, and is outputted as estimate, in order to solve the above technical problem.

[0009] According to the above-mentioned configuration, transfer information, such as the speech information and image information from an operator, text,

and software information, can be communicated by the transmitting section and the receive section.

[0010] Furthermore, with the above-mentioned configuration, the estimate about temper and feeling of the operator of a transmitting side, health condition, the situation of having occurred around, etc. can be extracted, presumed and outputted in the presumed section out of the communication link information which communicates.

[0011] Therefore, in the above-mentioned configuration, based on the estimate which a transmitting side does not mean, a receiving side can assist an understanding of the above-mentioned transfer information by the outputted estimate, and it not only merely receives the transfer information on a transmitting side as it is, but can perform a communication link on deeper level more effectively.

[0012] The above-mentioned transfer information may contain speech information. A receiving side not only merely receives the language of the transmitting side based on speech information as it is, but it can presume the situation extracted the information (audio strength, change of an accent location, surrounding noise, etc.) which a transmitting side did not necessarily send intentionally, and have occurred from there, for example in temper and feeling of the operator of a transmitting side, health condition, and a perimeter etc., from

the speech information which communicates according to the above-mentioned configuration, and it can offer a means understand the semantics more deeply.

[0013] The above-mentioned transfer information may contain image information. the information (a look --) which a transmitting side did not necessarily send intentionally from the image information which communicates according to the above-mentioned configuration a blink, the magnitude of a pupil, a motion of a lip, dryness of opening and a lip, the expression of the face and a color, a body motion, and a posture -- or It extracts the number of the men of the equipment circumference, lightness, the weather, etc., and he can presume from there the temper and feeling of a transmitting side, health condition, the situation of having occurred around, etc., and a receiving side not only merely receives the language of the transmitting side based on image information as it is, but can understand the semantics more deeply.

[0014] In the above-mentioned communication device, it has further the vital sign measurement section which measures vital signs, such as an operator's heart rate, as vital sign information, and communication link information may include vital sign information. In the above-mentioned communication device, it has further the environmental measurement section in a circumference environment which measures physical information, such as atmospheric temperature, and communication link information may include the above-mentioned physical

information.

[0015] According to the above-mentioned configuration, not only in transfer information, such as the conventional speech information, text, image information, and software information the vital sign information as various data of a transmitting side or a receiving side, and physical information (it can set to the operator who grasps the body of a communication device which contained the transmitting section or a receive section --) Since it is possible for the myoelectric potential of a hand, a heartbeat, skin resistance, temperature, atmospheric temperature, etc. to come to hand by the receiving side, the temper and feeling of a transmitting side, health condition, the situation of having occurred around, etc. can be presumed more easily.

[0016] In the above-mentioned communication device, it has the body of a communication device which contains either [at least] the transmitting section or a receive section, and, as for the above-mentioned vital sign measurement section, it is desirable to be prepared in the part which can contact the operator in the body of a communication device.

[0017] According to the above-mentioned configuration, direct to the operator of a transmitting side or a receiving side, or since the sensor of the vital sign measurement section can be operated in the condition of having made it approaching very much, the biological information of a transmitting side or a

receiving side can be more precisely measured in the very natural condition.

[0018] In the above-mentioned communication device, it has further the storage section which memorizes an operator's individual humanity news and social information, and the presumed section uses an operator's individual humanity news and social information, when presuming estimate based on communication link information.

[0019] the situation of having occurred in the temper and feeling of a transmitting side, health condition, and a perimeter since it can already refer to the clear individual humanity news of a transmitting side or a receiving side, and social information according to the above-mentioned configuration -- more -- precise -- a receiving side and a transmitting side -- calculation -- or it can presume.

[0020] In the above-mentioned communication device, the presumed section may have for estimate remaining as it is or the function which is processed and is outputted in a receiving side. According to the above-mentioned configuration, it can let a display and the voice output section pass, for example, and the temper and feeling of a transmitting side, health condition, the situation of having occurred around, etc. can be shown more intelligibly for a receiving side, and concretely.

[0021] In the above-mentioned communication device, the presumed section may have for estimate remaining as it is or the function which is processed and

is outputted in a transmitting side. According to the above-mentioned configuration, since not only a receiving side but a transmitting side can share such estimate, it can be carried out more smoothly in a communication link, being able to check the contents of the communication link information which communicates and being able to apply feedback to a transmitting side.

[0022] In the above-mentioned communication device, the presumed section expresses the feeling of an operator's joy, anger, humor and pathos based on an operator's psychology and physiology condition which were acquired. According to the above-mentioned configuration, a judgment about the feeling of a transmitting side can be made more quickly and exactly by the receiving side by representing various human beings' feeling with some side faces.

[0023] In the above-mentioned communication device, the presumed section outputs estimate with processing gestalten, such as expression of a table, a graph or a graphic form, or a face, and a color. According to the above-mentioned configuration, the temper and feeling of a transmitting side, health condition, the situation of having occurred around, etc. can be shown more intelligibly for a receiving side, and concretely.

[0024] In the above-mentioned communication device, it has the display which displays the image information contained in communication link information, and juxtapose or pile up, and the presumed section makes estimate suit the image

information of a transmitting side, and displays it by the above-mentioned display. According to the above-mentioned configuration, when the temper and feeling of the presumed transmitting side compare with the image of an actual transmitting side health condition, the situation of having occurred around, etc., a more adequate judgment can be made by the receiving side.

[0025] In the above-mentioned communication device, you may have the selection section which chooses authorization of transmission of communication link information, or reception, disapproval or authorization of an output, and disapproval by either [at least] the transmitting side or the receiving side.

[0026] According to the above-mentioned configuration, by the ability leaving transmission or authorization of receiving for the information which a transmitting side does not mean to decision of a receiving side and each transmitting side, when estimate is unnecessary, communicative complicated-ization can be avoided.

[0027] In the above-mentioned communication device, you may have the conversion section to which transfer information is changed based on estimate. According to the above-mentioned configuration, a communication link can be carried out more smoothly by making it change so that feeling may be emphasized more for the voice which is sent out from change, for example, a loudspeaker, in transfer information and which is transmitted and received by the

conversion section or feeling may be hidden conversely.

[0028] The correspondence procedure of this invention is characterized by presuming and outputting an operator's psychology and physiology condition based on the above-mentioned communication link information, when an operator communicates using communication link information including the transfer information from an operator, in order to solve the aforementioned technical problem.

[0029] In the above-mentioned correspondence procedure, an operator's individual humanity news and social information are memorized, an operator's individual humanity news and social information may also be taken into consideration, and an operator's psychology and physiology condition may be presumed and outputted.

[0030] In the above-mentioned correspondence procedure, vital sign information, such as an operator's heart rate, is measured, and the above-mentioned vital sign information may be added to communication link information, and you may communicate.

[0031] Since it becomes more intelligible in a receiving side (a comb is also for a transmitting side) about the temper and feeling of a transmitting side, health condition, the situation of having occurred around, etc. according to the above-mentioned all directions method, the communication link between a

transmitting side and a receiving side can be carried out more smoothly.

[0032]

[Embodiment of the Invention] It will be as follows if each gestalt of operation of this invention is explained based on drawing 1 thru/or drawing 18 . In the above-mentioned communication device, as shown in drawing 1 , the communication link information 12 including transfer information, such as speech information and image information, is inputted. The biological information and the physical information on a perimeter environment which show an operator's condition from the transmitting section 11 which transmits the above-mentioned communication link information 12, the receive section 13 which receives and outputs the transmitted communication link information 12, and the above-mentioned communication link information are extracted and presumed. The biological information (physical information on environmental) processing section 14 as the presumed section outputted as estimate is formed.

[0033] The communication link information 12 sent from the transmitting section 11 of a transmitting side is a thing for [which is processed in the biological-information (physical information on environmental) processing section 14, extracts and presumes a transmitting side's psychology and physiology condition of an operator based on the above-mentioned communication link information 12, and outputs to the operator of a receiving

side] being received in the receive section 13 of a receiving side, and being contained in the communication link information 12 while outputting transfer information, such as speech information and image information, to the operator of a receiving side, for example.

[0034] The point of presuming the psychology of the operator of a transmitting side, and a physiology condition or the physical condition of the circumference environment in a transmitting side from the communication link information 12 rather than performing only decoding (it returning to the original form before transmitting transfer information) like the decoder looked at by the conventional communication device in the communication device of this invention is the focus. For this reason, the measurement section 10 for measuring the biological information and the physical information for presuming the psychology of the operator of a transmitting side, and a physiology condition or the physical condition of the circumference environment in a transmitting side is formed if needed. Such the measurement section 10 is explained in full detail below, respectively.

[0035] The gestalt of other operations which gave bidirection is shown in drawing 2 to the communication device shown in drawing 1 . When the function of this invention is given to the present cellular phone, for example, as shown in drawing 2 , it becomes the configuration of having a receive section 13, the

biological information (physical information on environmental) processing section 14 and the transmitting section 11, and the transmitting section 41 that has the same function in the bodies 15 of a communication device, such as a case.

[0036] Next, when communication link information 12 is made into speech information or image information, the gestalt of other operations is further shown in drawing 3 . For example, in the present cellular phone, the information mainly transmitted being restricted to speech information, and being added there also with a future near cellular phone is restricted to the image information of a transmitting side. For this reason, to application with a cellular phone, the extract (presumption) of the estimate using the biological information (environmental physical situation) processing section 14 based on either [at least] speech information or image information is simple.

[0037] Based on the timing which will win popularity whenever [audio frequency (height), strength (energy density), voiceprint, intonation, speed / of conversation /, and agitation], and will respond if it is speech information in that case, if it is image information Based on a look, a blink, the magnitude of a pupil, a motion of a lip, dryness of opening and a lip, the expression of the face and a color, a body motion, a posture, the number of the men of the equipment circumference, lightness, the weather, etc., temper and feeling of the operator of a transmitting

side, health condition, the situation of having occurred around the above-mentioned operator, etc. can be presumed from there. It is still more effective if presumption is performed from the information on both speech information and image information.

[0038] In order to perform a more precise extract, the gestalt of operation of further others which measures speech information or not only image information but various information is shown in drawing 4 . The biological information and the physical information which are shown with the electric resistance measured in the measurement section 10 and physical quantity (an electrical-potential-difference value, a current value, or potential difference) equivalent to it are included and transmitted to the communication link information 12 from the transmitting section 11, and it is reception and the biological information (environmental physical situation) processing section 14 in a receive section 13, and is used for presumption of the feeling of the state of mind and physiology condition of a transmitting side etc.

[0039] As the above-mentioned concrete example, there are distribution of an electroencephalogram, magnetoencephalography, blood pressure, a heart rate, a respiration rate, skin resistance, a sweat rate, temperature, and ******, vibration of body of communication device 15 grade, atmospheric temperature, humidity, an atmospheric pressure, a wind force, wind direction, lightness, air

purity, a geographic coordinate, altitude, sound, etc.

[0040] Next, since more various presumption of the one where the reaction (a state of mind, a physiology condition, and physical information) of the receiving side to the communication link information on a transmitting side is also clearer is attained when a communication link is bidirectional, with the gestalt of other operations to the pan shown in drawing 4 , the same measurement section 17 and same interface 18 as the measurement section 10 possess also in the receiving side. These measurement sections 10 and 17 of the thing only with good either are clear.

[0041] Moreover, these measurement sections 10 and 17 are forming a sensor in a part for one [at least] attaching part of the transmitting side in the body 15 of a communication device, and a receiving side (location where an operator's contacts or approaches), and more precisely, it is in a very natural condition and it becomes possible to measure the biological information about the operator of a transmitting side or a receiving side.

[0042] Next, it not only uses the communication link information 12 incorporated during the communication link, but [when presuming the psychology of the operator of a transmitting side, and a physiology condition or the physical condition of a circumference environment,] the gestalt of operation of further others which makes the receiving side memorize the known information of a

transmitting side or a receiving side is beforehand shown in drawing 5 .

[0043] With the gestalt of this operation, when extracting in the biological information (environmental physical situation) processing section 14, the telephone number of the known information stored not only in the information under communication link received in the receive section 13 but in the storage section 19, for example, a transmitting side, and a receiving side, sex, age, mutual social relation, etc. are used. Moreover, although not illustrated, the gestalt which forms the storage section 19 in a transmitting side, and is incorporated from an origination side to a receiving side by making the above-mentioned known information into communication link information is sufficient.

[0044] Furthermore, the gestalt of operation of further others which incorporates not only the information on those receiving sides and a transmitting side but a third person's information is shown in drawing 6 . With the gestalt of this operation, by the biological information (physical information on environmental) processing section 14, when a third person's information is needed, the transceiver section 21 to the third person who outputted the communication link demand 20 for a third person from the biological information (physical information on environmental) processing section 14, and received it receives the communication link information 22 required among third persons, and

outputs it to the biological-information (physical information on environmental) processing section 14. As this application, access of SABAHE which is a mass database, information gathering through networks including the Internet, etc. are mentioned.

[0045] Then, the communication link result is memorized for every operator, and the gestalt of other operations is shown in the pan used for the biological information (physical information on environmental) processing in the communication link after it at drawing 7 . With the gestalt of this operation, the result of the biological information (physical information on environmental) processing section 14 is stored in the storage section 24 for every operator as feedback 23 of the contents of processing. This performs renewal of information required for processing, and study of a processing algorithm.

[0046] Next, in order to make it easier to understand, as the processed contents are shown in drawing 8 by the receiving side, the gestalt of other operations is shown in the pan equipped with the display 25 below. With the gestalt of this operation, the displays 25, such as a liquid crystal display for displaying the processing result of the biological information (physical information on environmental) processing section 14, are formed. Although drawing 8 showed the gestalt of operation which added the display 25 to drawing 1 , it is clear from drawing 2 that you may combine with any of drawing 7 .

[0047] Drawing as estimate and the example of a graph which are displayed on a display 25 are shown in drawing 9 thru/or drawing 14 . For example, when displaying the feeling of a transmitting side etc., it will display using some parameters (biological information and physical information). When drawing 10 is explained as an example, in the parameter 1 of an axis of ordinate, for example "Strength of feeling (the forward direction strength)", the parameter 2 of an axis of abscissa -- "pleasure and pain (easy in the forward direction)" -- taking -- a first quadrant -- "**" and a second quadrant -- "**" and a third quadrant -- "pity" and a fourth quadrant -- "comfort" -- then the mark 27 displayed by the luminescent spot -- joy, anger, humor and pathos -- and -- to that extent -- ** -- it carries out, feeling etc. is expressed and it becomes possible to set up so that the operator of a receiving side can understand the above-mentioned feeling etc. easily.

[0048] Even if a parameter takes and there are more shafts (refer to drawing 11), each marks 26 and 28 shown by those luminescent spots depending on the direction can express feeling etc. at least (refer to drawing 9), and it is good as for a radar chart 30 like drawing 13 in a graph 29 expressing like drawing 12 .

[0049] A display like drawing 14 using the picture (illustration) 31 describing a face as a more intelligible example is also considered. With the picture (illustration) 31 shown in drawing 14 , 31f of displays of the resentment by the

display of the blowdown of display 31to notice e which blinks configuration display 31a of an eye, configuration display 31b of opening, display 31c of a tear, 31d of displays of a cold sweat, and an electric light, and a cloud type etc. can express the feeling of the operator of a transmitting side etc., for example. Besides it, the various expression approaches, such as a dispersion diagram, a doughnut Fig., and a pie chart, can be used.

[0050] In such a display, an important thing is in the point represented with some specific parameters, in order to show the psychology of a transmitting side, and a physiology condition or the physical condition of a circumference environment.

[0051] If such a display is juxtaposed with the image of an actual transmitting side or is displayed in piles, it is very useful when a receiving side understands the situation of a transmitting side. The gestalt of operation of further others it enabled it to see also by the transmitting side in this display is shown in drawing 15 . It not only outputs the processing result of the biological information (physical information on environmental) processing section 14 to the display 25 of a receiving side, but with the gestalt of this operation, it outputs it to the display 35 of a transmitting side through the transmitting section 41 and a receive section 43. Since a transmitting side can carry out the monitor of how it is received by the receiving side, the suitable feedback of it is also attained.

[0052] The above-mentioned display 35 has the same function as the display 25

of a receiving side. Moreover, in order to give each switch function mentioned later to each displays 25 and 35, it is desirable to prepare the touch-sensitive transparent input section on a display screen, and to prepare an input function called the switch which **** various functions by the input by contacting the input by the contact using an operator's hand and the input pen which an operator operates by the icon on a display screen etc.

[0053] In a transmitting side or a receiving side, since there may be such a display needlessness or also when judging that it is not desirable, it is desirable that the authorization and disapproval are mutually controllable. Although the drawing based on drawing 1 was used about each explanation of the gestalt of each operation based on the above drawing 3 thru/or drawing 15 , it is clear that the bidirectional configuration of drawing 2 is applicable to them.

[0054] Below, the above-mentioned measurement section 10 is explained according to each parameter used as the candidate for measurement. The measurement section 10 for measuring an operator's psychology and physiology condition For example, the electroencephalogram which detects the activity situation of an operator's brain, frequency of a blink of an eye, electric resistance of the skin (it is hereafter called skin resistance), a sweat rate, the intonation of voice, a body motion, a motion of opening, dryness and a motion of a head, the magnitude of a pupil, the expression of the face, a heart rate, a respiration rate,

a respiratory condition, and a body surface -- warm -- ** -- the item chosen at least one from groups is detected as biological information.

[0055] For example, it is as follows, when an electroencephalogram is measured and it is biological information. There are four sorts of frequency bands represented in an electroencephalogram. It is the frequency band of the delta wave (0.5-4Hz), a theta wave (4-8Hz), an alpha wave (8-14Hz), and a beta rhythm (14-30Hz). The delta wave is an electroencephalogram which appears at the time of sleep, a theta wave is an electroencephalogram which appears in the deep relaxed state at the time of meditation etc., an alpha wave is an electroencephalogram which appears in a relaxed state at the time of the relaxed state when relaxing, or the moral concentration when memorizing, and a beta rhythm is an electroencephalogram which appears when tonus is high.

[0056] The method of detecting the feeble electrodermal activity change between these in simple as an electroencephalogram is mentioned with the head strap which touches regio-frontalis-capitis epidermis as a simple means as the approach of such electroencephalogram detection, for example, and the lug electrode which touches lug epidermis (for example, epidermis of an earlobe).

[0057] When communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition, or] psychology and physiology condition

by oneself, by connecting the measurement section 10 of simple detection of the above-mentioned electroencephalogram to an interface 16, the biological information by the electroencephalogram is measured, and it is made to contain in the communication link information 12, and transmits to a communication device.

[0058] In the biological information (physical information on environmental) processing section 14 in a receive section 13 side, frequency analysis of the biological information of the measured electroencephalogram is carried out, and it is fundamentally classified to four sorts mentioned above of frequency bands represented, and based on the frequency band, as shown in drawing 10 and drawing 12 , it displays the feeling of a transmitting side etc.

[0059] For example, since a parameter becomes only one sort when it displays with the parameter of only an electroencephalogram, it becomes the movement magnitude of only the direction of an axis of ordinate of a single dimension, or the direction of an axis of abscissa. However, if based on the analysis of a multivariate with one sort of parameters which will otherwise be accepted, it will become the display of the direction of two dimension.

[0060] Next, the modification of the gestalt of this operation is explained. Namely, what is necessary is to prepare the biological information (physical information on environmental) processing section 14, the same biological information

(physical information on environmental) processing section 44, and the display 25 of a receiving side and the same display 35 also in a transmitting side, and just to set up also by the transmitting side (measurement side), so that the frequency analysis information on the electroencephalogram of the biological information (physical information on environmental) processing section 44 may be indicated by delivery at the display 35 of a transmitting side in displaying the feeling of a transmitting side etc. Or the frequency analysis information on the electroencephalogram of the biological information (physical information on environmental) processing section 44 of a transmitting side may be displayed on the display 25 of a receiving side using the frequency analysis information received to the receive section 13 in delivery and a receive section 13.

[0061] In this case, the display of the psychology by the electroencephalogram of the operator of a transmitting side or a physiology condition is possible on the both sides of a receiving side and a transmitting side. Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side However, transmitting authorization of an operator's psychology or physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at

the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0062] Or the biological information by the measured electroencephalogram In the biological information (physical information on environmental) processing section 14 inputted from the receive section 13 which was transmitted from the transmitting section 11, without being then analyzed and processed, and received Frequency analysis is carried out and it is classified into four sorts of represented frequency bands fundamentally [the above], and based on the frequency band, you may set up so that an indication like drawing 10 and drawing 12 may be given in a display 25.

[0063] As other modifications, when displaying by the transmitting side, you may set up so that the frequency analysis information on the electroencephalogram which was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side may be sent to a transmitting side. The analysis information on psychology or a physiology condition by the electroencephalogram sent to the transmitting side is sent to the display 35 by the side of measurement as it is, and should just give an indication like drawing 10 and drawing 12 based on the

wave number band fundamentally classified into four sorts of frequency bands represented.

[0064] Next, in the measurement section 10, when a heart rate is measured and it is biological information, it is as follows. Since it becomes late, and a heart rate and a pulse have the excited inclination which becomes quick when it is got blocked and tonus increases when a mental and mental condition is stabilized, they reflect activity mental [change of a heart rate and a pulse], and mental.

[0065] The simple detection approaches, such as a thing which used the change of the reflection factor on the front face of the skin based on change on the front face of the skin by the pressure pulse wave by LED and the photo detector as a measuring method of a heart rate and a pulse, or a thing which uses a pressure sensor and measures change of a direct pressure pulse wave, are mentioned. The gestalt of communication devices, such as a cellular phone of a wrist watch mold, is suitable for this.

[0066] When communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition, or] psychology and physiology condition by oneself What is necessary is to connect the measurement section 10 of simple detection of the above-mentioned heart rate to an interface 16, to measure the biological information by the heart rate, to input and transmit to the

transmitting section 11, and just to set up so that it may display on the display 25 of a receiving side or the above-mentioned biological information may be displayed on the display 35 of a transmitting side.

[0067] For example, if the heart rate which will be measured if the pulse rate of an average of an operator is set to P100 (a part for about 60 - 80 times/) performs the display of a zero or the average in the display of drawing 10 or drawing 12 at the time of about P100, for example, a pulse rate increases more than P100, in the display of the parameter 1 of drawing 10 , it moves to the right, and when fewer than P100, it will move to the left.

[0068] Since a parameter becomes only one sort, it becomes the movement magnitude of only the direction of an axis of ordinate of a single dimension, or the direction of an axis of abscissa. However, if based on the analysis of a multivariate with one sort of parameters which will otherwise be accepted, it will become the display of the direction of two dimension.

[0069] Or how to decide the coordinate or quadrant of a relaxation, usual, and stress ** can be considered beforehand. For example, focusing on P100, more greatly 90% or less than a relaxation and 90%, 150% or less is judged to be usual, and 150% or more is judged to be stress.

[0070] This criterion may be changed using physical information, such as individual difference, age, and atmospheric temperature mentioned later, etc.

When a mark is blinked in a second quadrant when a mark is blinked in a first quadrant when judged as usual, and it is judged that it is relaxed, and judged as stress, the approach of blinking a mark in a fourth quadrant etc. may be used.

[0071] Moreover, the alphabetic character of "a relaxation", usual ["usual"], and "stress" may be displayed. Or there is also a method of changing the color of a display and the color of the background. They are [relaxation] yellow, red, etc. about green and stress in blue and usual.

[0072] Or the approach of changing the sound of a background etc. may be used. Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of feeling decision, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0073] Furthermore, when displaying the above-mentioned parameter by the transmitting side, the pulse rate information taken out from the biological information (physical information on environmental) processing section 44 of a transmitting side will be sent and displayed on the display 35 of a transmitting side. Or you may set up so that the pulse rate information on the biological information (physical information on environmental) processing section 44 of a transmitting side may be displayed on the display 25 of a receiving side using the pulse rate information received to the receive section 13 in delivery and a receive section 13.

[0074] In this case, the displays of the psychology by the pulse rate of the operator of a transmitting side or a physiology condition are the both sides of a receiving side and a transmitting side, and are possible. Even if it is the above-mentioned case, like the case of an electroencephalogram in the transmitting section 11 of a transmitting side To the receive section 13 of transmitting authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side, reception authorization, By forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a disapproval switch or a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0075] Or it is transmitted from the transmitting section 11, without being analyzed and processed as it is, the biological information by the measured pulse rate is analyzed in the biological-information (physical information on environmental) processing section 14 inputted from the receive section 13 which received, is classified into three sorts of states of mind represented fundamentally [the above], and it may set up based on the result so that an indication like drawing 10 and drawing 12 may be given in a display 25.

[0076] As other modifications, when displaying by the transmitting side, the analysis information on the pulse rate which was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side will be sent to a transmitting side. The analysis information on psychology or a physiology condition by the pulse rate sent to the transmitting side is sent to the display 35 of a transmitting side as it is, is fundamentally classified into three sorts of states of mind represented, and it may be set up so that an indication like drawing 10 and drawing 12 may be given.

[0077] Next, in the measurement section 10, when ****** is measured and it is biological information, it is as follows. Since a peripheral vessel extends a more stable condition and arterial blood flows mentally [******] and mentally, the temperature of a body surface rises, but when tonus increases, since a peripheral vessel contracts, there is an inclination for the inflow of the arterial blood to a body surface to decrease, and for temperature to fall. Detection of this ****** is easily detectable with temperature sensors, such as a thermistor. The gestalt of communication devices, such as a cellular phone of the form held by the hand which is not an earphone type, is suitable for this. As for temperature sensors, such as a thermistor, it is desirable that the part of the body 15 of a communication device which an operator holds by hand is equipped as the

measurement section 10.

[0078] [when communicating with a partner, checking its own / the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition, or / psychology and physiology condition by oneself] What is necessary is to turn ON the measurement section 10 of simple detection of ****** of the above-mentioned hand, and to measure the biological information by ****** of a hand, to input to the transmitting section 11, and just to set up through an interface 16, so that it may display by the display 25 of a receiving side, or the display 35 of a transmitting side as mentioned above.

[0079] For example, if the display of a zero or the average is performed, for example, ****** becomes high from S100 in the display of drawing 10 or drawing 12 at the time of about S100, in the display of the parameter 1 of drawing 10 , it moves to the right, and ****** which will be measured if ****** of the hand of an average of an operator is set to S100 (about 31.1 degrees C) will move to the left, when lower than S100.

[0080] Or how to decide the coordinate or quadrant of a relaxation, usual, and stress ** can be considered beforehand. For example, focusing on S100, a relaxation and -0.1 degrees C - +0.1 degrees C are judged to be usual, and -0.2--0.4 degree C is judged to be stress for +0.2-+0.4 degrees C. Or while talking over the telephone only by telephone etc., as long as it goes up by 0.1

degrees C or more on the basis of ****** of the hand at the message initiation time, and it descends by 0.1 degrees C or more, a relaxation, and stress and the method of judging except [its] to be usual may be used. This criterion may be changed according to individual difference, age, etc.

[0081] Moreover, since ****** of a hand influences somewhat also with environmental temperature, it may form the measurement section 10 of a thermistor in the part which does not touch the body separately, may measure environmental temperature, and may apply amendment to the value of ****** of the above-mentioned hand with the value. When a mark is blinked in a second quadrant when a mark is blinked in a first quadrant when judged as usual, and it is judged that it is relaxed, and judged as stress, the approach of blinking a mark in a fourth quadrant etc. may be used.

[0082] Or the alphabetic character of "a relaxation", usual ["usual"], and "stress" may be displayed. Or there is also a method of changing the color of a display. They are [relaxation] yellow, red, etc. about green and stress in blue and usual. Or the method of changing the sound of a background etc. is considered.

[0083] Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of feeling decision, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0084] Furthermore, as other modifications, when displaying by the transmitting side, you may set up so that the body surface sympathy news taken out from the biological information (physical information on environmental) processing section 44 of a transmitting side may be sent to the display 35 of a transmitting side. Or you may set up so that the body surface sympathy news of the biological information (physical information on environmental) processing section 44 of a transmitting side may be displayed on the display 25 of a receiving side by the body surface sympathy news received to the receive section 13 in delivery and a receive section 13. In this case, the display of the psychology by ****** of the operator of a transmitting side or a physiology condition is possible on the both sides of a receiving side and a transmitting side.

[0085] Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side Transmitting authorization of an operator's psychology or physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology

status information.

[0086] Or the biological information by measured ****** In the biological information (physical information on environmental) processing section 14 inputted from the receive section 13 which was transmitted from the transmitting section 11, without being then analyzed and processed, and received It is analyzed and is classified into three sorts of states of mind represented fundamentally [the above], and based on the result, you may set up so that an indication like drawing 10 and drawing 12 may be given in a display 25.

[0087] As other modifications, in displaying by the transmitting side The analysis information on ****** which was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side to a transmitting side Delivery, The analysis information on psychology or a physiology condition by ****** sent to the transmitting side may be sent to the display 35 of a transmitting side as it is, and may be fundamentally classified into three sorts of states of mind represented, and you may set up so that an indication like drawing 10 and drawing 12 may be given.

[0088] Next, in the measurement section 10, when the result of having measured the blink of an eye is made into biological information, it is as follows. A blink reflects moral (psychology) activities, such as tonus and interest. A blink

decreases, when cautions are turned outside, and when it turns inside, it increases. That is, if the object currently seen is interesting, when attracting attention, and a blink is controlled at a case and it is conversely released from the condition, it is in the inclination which increases temporarily on the rebound.

[0089] If a blink is controlled and it is released from such a condition if the object which in other words is observing the blink is interesting, or when attracting attention, occurrence frequency will tend to increase temporarily conversely shortly. Therefore, the occurrence frequency of a blink can also be used as other **-evaluation index (parameter).

[0090] The movement toward a blink is easily detectable with motion detection of the edge of the image by CCD or CMOS image sensors. The gestalt of the cellular phone equipped with CCD or CMOS image sensors, a TV phone, and a PDA communication device with a camera is suitable for this. The gestalt of communication devices, such as an earphone type cellular phone, is suitable for this.

[0091] As for CCD or CMOS image sensors, it is desirable that the whole face or the location of the body 15 of a communication device which can begin to project the circumference of an eye at least is equipped with the image as the measurement section 10.

[0092] What is necessary is to turn ON the measurement section 10 of simple

detection of a blink of the above-mentioned eye, to measure the biological information by blink, to input into the transmitting section 11 through an interface 16, and just to set up so that it may display by the display 25 of a receiving side, and the display 35 of a transmitting side when communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition, or] psychology and physiology condition by itself.

[0093] for example, if the number of blinks which will be measured if the number of blinks of an average of an operator is set to M100 (a part for 45 times/) performs the display of a zero or the average in the display of drawing 10 or drawing 12 at the time of about M100, for example, the number of blinks increases more than M100, in the display of the parameter 1 of drawing 10 , it moves to the right, and when fewer than M100, it will move to the left. Since a parameter becomes only one sort, it becomes the movement magnitude of only the direction of an axis of ordinate of a single dimension, or the direction of an axis of abscissa. However, if based on the analysis of a multivariate with one sort of parameters which will otherwise be accepted, it will become the display of the direction of two dimension.

[0094] Or how to decide the coordinate or quadrant of a relaxation, usual, stress, or interest ** can be considered beforehand. For example, when at least one

third of M100 became extent focusing on M100 (per minute about ten times), it considers as stress or interest and a upward tendency (60 is exceeded or it increases 45 times for /) is shown suddenly, the relaxation released from stress and except [its] are judged to be usual. This criterion may be changed according to individual difference, age, etc.

[0095] When a mark is blinked in a second quadrant when a mark is blinked in a first quadrant when judged as usual, and it is judged that it is relaxed, and judged as stress, interest, or concentration, how to blink a mark in a fourth quadrant etc. can be considered.

[0096] Or the alphabetic character of "a relaxation", usual ["usual"], and "stress and interest" may be displayed. Or there is also a method of changing the color of a display. He is [relaxation] red etc. about green, and stress and concentration in blue and usual. Or the method of changing the sound of a background etc. is considered. Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of feeling decision, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0097] Furthermore, as other modifications, when displaying by the transmitting side, you may set up so that the count information of a blink taken out from the biological information (physical information on environmental) processing

section 44 of a transmitting side may be sent to the display 35 of a transmitting side. or the number information of blinks on the biological information (physical information on environmental) processing section 44 of a transmitting side was received to the receive section 13 in delivery and a receive section 13 -- you may set up so that it may wink and may display on the display 25 of a receiving side using number information. In this case, the displays of the psychology by the number of blinks of the operator of a transmitting side or a physiology condition are the both sides of a receiving side and a transmitting side, and are possible.

[0098] Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side Transmitting authorization of an operator's psychology or physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0099] Wink and or the measured biological information by the number In the biological information (physical information on environmental) processing

section 14 inputted from the receive section 13 which was transmitted from the transmitting section 11, without being then analyzed and processed, and received It is analyzed, is classified into three sorts of states of mind represented fundamentally [the above], and may be made to give an indication like drawing 10 and drawing 12 in a display 25 based on the result.

[0100] As other modifications, when displaying by the transmitting side, you may set up so that the analysis information on the number of blinks which was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side may be sent to a transmitting side. The analysis information on psychology or a physiology condition by the number of blinks sent to the transmitting side is sent to the display 35 of a transmitting side as it is, is fundamentally classified into three sorts of states of mind represented, and may be made to give an indication like drawing 10 and drawing 12 .

[0101] Next, in the measurement section 10, when it is the biological information which measures a pupillary reaction, it is as follows. Although a pupil produces a pupillary light reflex, near seeing reflection, etc., it is changed also by reflection accompanying a moral (psychology) activity. A pupillary reaction is interested reflecting moral (psychology) activities, such as interest, and when tonus is high, the relative rate of increase of pupil area is high, and carries out mydriasis. It is

uninterested, and a miosis is carried out when tonus is low.

[0102] A motion of a pupil is easily detectable with motion detection of the edge of the image by CCD or CMOS image sensors. The gestalt of the cellular phone equipped with CCD or CMOS image sensors, a TV phone, and a PDA communication device with a camera is suitable for this. Especially, the gestalt of communication devices, such as an earphone type cellular phone, is suitable for this.

[0103] As for CCD or CMOS image sensors, it is desirable to equip with the image the location of the body 15 of a communication device which can begin to project the whole eye or the magnitude of a pupil as the measurement section 10. When communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition, or] psychology and physiology condition by oneself, the measurement section 10 of simple detection of the magnitude of the above-mentioned pupil is turned ON, the biological information by the magnitude of a pupil is measured through an interface 16, and it inputs into a communication device.

[0104] When magnitude of the pupil of an average of an operator is set to D100 (rate of increase 0), the magnitude of the pupil measured for example, at the time of about 100 D In the display of drawing 10 or drawing 12 , if the display of a

zero or the average is performed, for example, the magnitude of a pupil becomes large from D100, in the display of the parameter 1 of drawing 10 , it moves to the right, and when the magnitude of a pupil is smaller than D100, it will move to the left. Since a parameter becomes only one sort, it becomes the movement magnitude of only the direction of an axis of ordinate of a single dimension, or the direction of an axis of abscissa. However, if based on the analysis of a multivariate with other parameters, it will become the display of the direction of many dimensions.

[0105] Or having interest, and no usual and interest or the method of deciding the coordinate or quadrant of dislike can be considered beforehand. For example, it supposes that interest was shown when the magnitude of a pupil was large at 30% or less, that is, mydriasis was carried out 10% or more to D100 a core [D100 (rate of increase 0)], and when the magnitude of a pupil is small at 20% or less, that is, a miosis is carried out 10% or more to D100, interest nothing or dislike, and except [its] are judged to be usual.

[0106] This criterion may be changed by individual difference, age, sex, etc. When a mark is blinked in a first quadrant when judged as usual, and judged as interest, a mark is blinked in a second quadrant, and or it was uninteresting, when it is judged as dislike, how to blink a mark in a fourth quadrant etc. can be considered.

[0107] Or the alphabetic character of "interest", usual ["usual"], and "those without interest and dislike" may be displayed. Or there is also a method of changing the color of a display. He is [interest] red etc. about green, those without interest, or dislike in blue and usual. Or the method of changing the sound of a background etc. is considered. Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of feeling decision, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0108] As a modification of the gestalt of this operation, when displaying by the transmitting side, you may set up so that the rate-of-change information on the magnitude of the pupil taken out from the biological information (physical information on environmental) processing section 44 of a transmitting side may be indicated by delivery at the display 35 of a transmitting side. Or you may make it display the rate-of-change information on the magnitude of the pupil of the biological information (physical information on environmental) processing section 44 of a transmitting side on the display 25 of a receiving side using the rate-of-change information on the magnitude of the pupil received to the receive section 13 in delivery and a receive section 13. In this case, the display of the psychology by the rate of change of the magnitude of the pupil of the operator of a transmitting side or a physiology condition is possible on the both sides of a

receiving side and a transmitting side.

[0109] Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side Transmitting authorization of an operator's psychology or physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0110] Or the biological information of the magnitude of the measured pupil In the biological information (physical information on environmental) processing section 14 inputted from the receive section 13 which was transmitted from the transmitting section 11, without being then analyzed and processed, and received It is analyzed, is classified into three sorts of states of mind represented fundamentally [the above], and may be made to give an indication like drawing 10 and drawing 12 in a display 25 based on the result.

[0111] As other modifications, in displaying by the transmitting side The analysis information on the rate of change of the magnitude of the pupil which was

measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side to a transmitting side Delivery, The analysis information on psychology or a physiology condition by the rate of change of the magnitude of a pupil sent to the transmitting side is sent to the display 35 of a transmitting side as it is, and it is fundamentally classified into three sorts of states of mind represented, and may be made to give an indication like drawing 10 and drawing 12 .

[0112] Next, in the measurement section 10, when skin resistance is made into the biological information to measure, it is as follows. Skin resistance is a thing which resistance increases by the mental stable state and receives stress and to which tonus is high in pneuma (psychology), or resistance decreases at the time of an agitation.

[0113] As an electric measuring method of skin resistance, 1 potential method, the electrization (a simple circuit and wheastone bridge circuit, a compensating method circuit, accumulation-of-electricity mind type circuit) by two direct currents, the electrization (wheastone bridge circuit) by three alternating currents, etc. can be mentioned.

[0114] The gestalt of communication devices, such as a telephone of the form held by the hand which is not an earphone type, is suitable for this. It is desirable to be equipped with the operator as the measurement section 10 of skin

resistance to the body 15 of a communication device of the part grasped by hand (maintenance).

[0115] What is necessary is to turn on the measurement section 10 which detects skin resistance of the above-mentioned hand, to measure the biological information by skin resistance of a hand, to input to the transmitting section 11 through an interface 16, and just to set up so that it may be similarly displayed as the above-mentioned when communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition, or] psychology and physiology condition by itself.

[0116] For example, at the time of about R100, in the display of drawing 10 or drawing 12 , if the display of a zero or the average is performed, for example, skin resistance becomes large from R100, in the display of the parameter 1 of drawing 10 , it moves to the left, and the skin resistance which will be measured if skin resistance of the hand of an average of an operator is set to R100 (about 15,000 ohm/cm 2) will display that it moves to the right, when lower than R100. Since a parameter becomes only one sort, it becomes the movement magnitude of only the direction of an axis of ordinate of a single dimension, or the direction of an axis of abscissa. However, if based on the analysis of a multivariate with other parameters, it will become the display of the direction of many dimensions.

[0117] Or how to decide the coordinate or quadrant of relaxation, usual, agitation, or stress ** can be considered beforehand. For example, an agitation or stress, and others are judged [5 times to 20 times] to be usual for a relaxation, 1 / 5 - 1/20 focusing on S100.

[0118] Or while talking over the telephone only by telephone etc., on the basis of skin resistance of the hand at the message initiation time, in several seconds, it decreases and a temporary thing is suddenly judged to be an agitation. This is considered that sweating by an agitation or stress is the cause.

[0119] This criterion may be changed according to individual difference, age, etc. Moreover, since ****** of a hand influences somewhat also with environmental temperature, it may prepare the measurement section of a thermistor in the part which does not touch the body separately, may measure environmental temperature, and may apply amendment to the value of above ****** with the value.

[0120] When a mark is blinked in a second quadrant when a mark is blinked in a first quadrant when judged as usual, and it is judged that it is relaxed, and judged as stress or an agitation, how to blink a mark in a fourth quadrant etc. can be considered.

[0121] Or the alphabetic character of "a relaxation", usual ["usual"], and "stress and an agitation" may be displayed. Or there is also a method of changing the

color of a display. They are [relaxation] yellow, red, etc. about green and stress in blue and usual. Or the method of changing the sound of a background etc. is considered. Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of feeling decision, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0122] What is necessary is just to indicate as a modification, the information on the magnitude of the skin resistance taken out from the biological information (physical information on environmental) processing section 44 of a transmitting side by delivery at the display 35 of a transmitting side, in displaying by the transmitting side. Or you may make it display the information on the magnitude of skin resistance of the biological information (physical information on environmental) processing section 44 of a transmitting side on the display 25 of a receiving side using the information on the magnitude of the skin resistance received to the receive section 13 in delivery and a receive section 13.

[0123] In this case, the display of the psychology by the magnitude and the rate of change of skin resistance of an operator of a transmitting side or a physiology condition is possible on the both sides of a receiving side and a transmitting side. Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side Transmitting authorization of an operator's psychology or

physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0124] Or the biological information of the magnitude of the measured skin resistance In the biological information (physical information on environmental) processing section 14 inputted from the receive section 13 which was transmitted from the transmitting section 11, without being then analyzed and processed, and received It is analyzed, is classified into three sorts of states of mind represented fundamentally [the above], and may be made to give an indication like drawing 10 and drawing 12 in a display 25 based on the result.

[0125] As other modifications, in displaying by the transmitting side The analysis information on the magnitude of skin resistance, or rate of change which was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side to a transmitting side Delivery, The analysis information on psychology or a

physiology condition by the magnitude and the rate of change of skin resistance which were sent to the transmitting side is sent to the display 35 of a transmitting side as it is, and it is fundamentally classified into three sorts of states of mind represented, and may be made to give an indication like drawing 10 and drawing 12 .

[0126] Next, it is as follows when voice is made into the biological information to measure, for example. Here, an example which shows the feeling of a transmitting side to a receiving side is described in detail from the audio frequency and the power of a transmitting side based on drawing 16 .

[0127] First, from the speech information of a transmitting side, in the frequency processing section 33, the frequency of speech information is sampled and it equalizes on real time. Real time is enough at intervals of 01 seconds - about 1 second so that the below-mentioned method of presentation may show. The power of speech information is also sampled to coincidence in the power processing section 32, and it is asked for the average. A Y-axis is set the X-axis as gap from the average of a frequency as gap from the average of power at a display 25 (drawing 17).

[0128] About X, when expressed with a formula, it is as follows. The same is said of Y. In addition, n is the natural number.

A sampling value The average Value of an axis of abscissa X fs (1) fm (1) =fs (1)

fs (1)-fm (1) fs (2) fm (2) = (fs(1)+fs (2))/2 fs (2)-fm (2) fs (3) fm (3) = (fs(1)+ -- +fs (3))/3 fs (3)-fm (3) - - - - - - - - - fs (n) fm (n) = (fs(1)+ -- +fs (n))/nfs (n)-fm Since the voice with the high (n) frequency is bright and low voice is dark, it can use as a parameter showing the pleasure and pain of feeling.

[0129] Moreover, since the feeling that the loud voice of power is strong, and small voice are considered to express weak feeling, it can use as a parameter showing the strength of feeling. the gap from the X-axis and average power which shows gap from an average frequency -- **** -- a Y-axis -- "**" and a third quadrant can express "pity" and a fourth quadrant can express [a first quadrant / "**" and a second quadrant] the feeling of joy, anger, humor and pathos as "comfort." This is outputted to a display 25 on real time, for example, it displays as a mark 34.

[0130] During a message, if the data of a transmitting side [real time / axis of coordinates / this] are indicated by the point as a mark 34, a receiving side looks at it and can judge the feeling of a transmitting side exactly more objective. When telephoning to the same transmitting side, it is also possible to also use the average in the past message. By this approach, since it can process only at the terminal of a receiving side, it is not necessary to take adjustment with a transmitting side etc. into consideration, and can introduce easily to the present cellular phone etc.

[0131] Or by audio intonation and the strength of language, it is glad and the feeling of the resentment and fear may be judged. For example, when the ending of conversation goes up, "joy", the case where the ending falls on the contrary, and low and strong voice judge it as the "resentment", and the voice with a frequency it is weak and high judges it as "fear." The biological information (physical information on environmental) processing section 14 makes the above judgments by sound pressure, the frequency of a sound, and its serial change by making the microphone of a telephone into the input section.

[0132] Although the above-mentioned example is divided into three kinds of feeling decision, much other feeling, such as "surprise", "psychological dependence", and "dislike", can be judged in approximation by computing the minimum value of an inner product value by creating the database by the VQ technique (vector quantization) by audio feeling. The gestalt of communication devices, such as all telephones, is suitable for this.

[0133] What is necessary is to turn ON the measurement section 10 of the above-mentioned voice feeling decision, to measure the biological information by voice feeling decision, to input into the transmitting section 11 through an interface 16, and just to display as mentioned above, when communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition,

or] psychology and physiology condition by itself.

[0134] Or beforehand, it is glad and how to decide the coordinate or quadrant of the resentment, fear, surprise, psychological dependence, and dislike can be considered. When the ending of conversation goes up, "joy", the case where the ending falls on the contrary, and low and strong voice judge it as the "resentment", and the voice with a frequency it is weak and high judges it as "fear." The feeling of "surprise", "psychological dependence", and "dislike" is judged by the VQ technique by audio feeling.

[0135] That is, beforehand, the inner product of the compression database of VQ of the voice which built the typical according to VQ about voice of feeling, such as psychological dependence and dislike, with surprise compression database, and was measured, and each feeling is taken, and the feeling of the database which took out the minimum value is judged to be the feeling of measurement voice. This criterion may be changed according to individual difference, age, etc.

[0136] For example, it can consider as the feeling display of many dimensions by considering the parameter of drawing 11 and drawing 13 as "joy", the "resentment", "fear", "surprise", "psychological dependence", "dislike", etc. respectively. And how to blink a mark in the quadrant of the parameter judged respectively etc. can be considered. Or alphabetic characters, such as "joy", "resentment", "fear", "surprise", "psychological dependence", and "dislike", may

be displayed.

[0137] Or there is also a method of changing the color of a display. They are [relaxation] yellow, red, etc. about green and stress in blue and usual. Or the method of changing the sound of a background etc. is considered. Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of feeling decision, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0138] Moreover, as an example of the judgment with another voice, the average of the difference of the highest frequency, lowest frequency, and the highest and lowest frequency, maximum amplitude, and the amplitude and the approach of speaking and judging from the max of the persistence time of language and distribution of the persistence time are also considered from the audio data in the sampling time for the judgment which was able to determine feeling, such as "joy", the "resentment", "sadness", and usual ["usual"]. These carry out the sample of the data beforehand, quantify characteristic quantity for every feeling as a gap from it focusing on usual about the above-mentioned feeling, and put it in a database.

[0139] The quantum data is quantified and the method of determining the feeling that the inner product value of the compressed data and sample voice by VQ, and the above-mentioned database serves as min as the feeling of sample voice

like the example like the point is also considered.

[0140] As a modification, when displaying by the transmitting side (transmitting side), it may be made to indicate the information on the voice feeling decision taken out from the biological information (physical information on environmental) processing section 44 of a transmitting side at the display 35 of a transmitting side by delivery. Or you may make it display the information on the voice feeling seal of the biological information (physical information on environmental) processing section 44 of a transmitting side on the display 25 of a receiving side using the information on the voice feeling decision received to the receive section 13 in delivery and a receive section 13.

[0141] In this case, the displays of the psychology by voice feeling decision of the operator of a transmitting side or a physiology condition are the both sides of a receiving side and a transmitting side, and are possible. Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side Transmitting authorization of an operator's psychology or physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status

information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0142] Or it is transmitted from the transmitting section 11, without being analyzed and processed as it is, audio biological information is analyzed in the biological information (physical information on environmental) processing section 14 inputted from the receive section 13 which received, is classified into 3-6 states of mind represented fundamentally [the above], and based on the result, it may be set up so that an indication like drawing 11 and drawing 13 may be given in a display 25. However, if based on the analysis of a multivariate with other parameters, it will become the display of more directions of many dimensions.

[0143] As other modifications, in displaying by the transmitting side The analysis information on the voice feeling decision which was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side to a transmitting side Delivery, The analysis information on psychology or a physiology condition by voice feeling decision sent to the transmitting side is sent to the display 35 of a transmitting side as it is, is fundamentally classified into 3-6 states of mind represented, and it may be made to give an indication like drawing 11 and drawing 13 .

[0144] Even if it is this case, an operator's intention can restrict an operator's psychology and presenting of physiology status information like the above-mentioned by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in transmitting authorization of an operator's psychology or physiology status information, a transmitting disapproval switch or reception authorization, a receiving disapproval switch, or displays 25 and 35.

[0145] Next, in the measurement section 10, when the strength grasped for holding the body 15 of a communication device is made into the biological information to measure, it is as follows. The strength grasped in order to hold will tend to become strong, if a more stable condition is weaker and tonus increases mentally and mentally. This detection is easily detectable with a pressure sensor. The gestalt of communication devices, such as a telephone of the form held by the hand which is not an earphone type, is suitable for this. As for a pressure sensor, it is desirable that the part of the body 15 of a communication device which an operator holds by hand is equipped as the measurement section 10.

[0146] The measurement section 10 which is the simple detector of the strength which grasps for the above-mentioned hand to hold when communicating with a partner, checking its own [the time of the operator of a communication device wanting to tell a communicative partner his psychology and physiology condition

or] psychology and physiology condition by itself turns ON, the biological information by the strength which grasps for holding through an interface 16 measures, it inputs and transmits to the transmitting section 11, and it displays as mentioned above.

[0147] When the strength grasped for an average of an operator to hold is set to H100, the strength grasped for [to hold] being measured for example, at the time of about H100 In the display of drawing 10 or drawing 12 , if the strength grasped for performing the display of a zero or the average, for example, holding becomes higher than H100, in the display of the parameter 1 of drawing 10 , it moves to the right, and when lower than H100, it will move to the left.

[0148] Since a parameter becomes only one sort, it becomes the movement magnitude of only the direction of an axis of ordinate of a single dimension, or the direction of an axis of abscissa. However, if based on the analysis of a multivariate with other parameters, it will become the display of the direction of many dimensions.

[0149] Or how to decide the coordinate or quadrant of a relaxation, usual, and stress ** can be considered beforehand. For example, 10% or more of increment of the strength which relaxes 10% of reduction of the strength grasped focusing on H100, and is grasped is judged to be stress, and except [its] is judged to be usual. Individual difference, age, etc. may amend this criterion.

[0150] When a mark is blinked in a second quadrant when a mark is blinked in a first quadrant when judged as usual, and it is judged that it is relaxed, and judged as stress, how to blink a mark in a fourth quadrant etc. can be considered.

[0151] Or the alphabetic character of "a relaxation", usual ["usual"], and "stress" may be displayed. Or there is also a method of changing the color of a display. They are [relaxation] yellow, red, etc. about green and stress in blue and usual. Or the method of changing the sound of a background etc. is considered. Or by emphasizing or decreasing the voice which flows from a loudspeaker and which is transmitted and received by the result of a judgment, and making it output, communication can be emphasized or feeling can be hidden conversely.

[0152] As a modification, when displaying by the transmitting side (transmitting side), it may be made to indicate the information at the display 35 of a transmitting side in the strength grasped for [to hold] being outputted from the biological information (physical information on environmental) processing section 44 of a transmitting side by delivery. Or you may display on the display 25 of a receiving side using information in the strength grasped for [which received information to the receive section 13 in delivery and a receive section 13 in the strength grasped for the biological information (physical information on environmental) processing section 44 of a transmitting side to hold] holding.

[0153] In this case, the display of the psychology by the strength grasped for the

operator of a transmitting side to hold or a physiology condition is possible on the both sides of a receiving side and a transmitting side. Even if it is the above-mentioned case, in the transmitting section 11 of a transmitting side Transmitting authorization of an operator's psychology or physiology status information, To the receive section 13 of a disapproval switch or a receiving side, reception authorization, a disapproval switch, Or by forming display authorization of an operator's psychology or physiology status information, and a disapproval switch in the display 35 of a transmitting side at the display 25 of display authorization of an operator's psychology or physiology status information, a disapproval switch, or a receiving side An operator's intention can restrict an operator's psychology and presenting of physiology status information.

[0154] Or it is transmitted from the transmitting section 11, without being analyzed and processed as it is, and in the biological-information (physical information on environmental) processing section 14 inputted from the receive section 13 which received, the biological information by the strength grasped for holding is analyzed, is classified into three sorts of states of mind represented fundamentally [the above], and gives an indication like drawing 10 and drawing 12 in a display 25 based on the result. Since a parameter becomes only one sort when it displays with the parameter of only the strength grasped for holding also in this case, it becomes the movement magnitude of the single dimension of only

the direction of an axis of ordinate, or the direction of an axis of abscissa.

[0155] As other modifications, in displaying by the transmitting side It was measured by the transmitting side and processed in the biological information (physical information on environmental) processing section 14 of a receiving side. Send the analysis information on psychology or a physiology condition by the strength grasped for the analysis information on the strength grasped for holding to have been sent [to hold] to the transmitting side by delivery and the transmitting side to the display 35 of a transmitting side as it is, and it is fundamentally classified into three sorts of states of mind represented. It may be made to give an indication like drawing 10 and drawing 12 .

[0156]

[Effect of the Invention] The communication device of this invention is the configuration of having the transmitting section for communicating communication link information including the transfer information from an operator as mentioned above and a receive section, and the presumed section that presumes an operator's psychology and physiology condition based on the communication link information which communicates, and is outputted as estimate.

[0157] So, since the above-mentioned configuration becomes more intelligible in a receiving side about the temper and feeling of a transmitting side, health

condition, the situation of having occurred around, etc., it does the effectiveness that the communication link between a transmitting side and a receiving side can be carried out more smoothly.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline block diagram of the communication device of this invention.

[Drawing 2] It is an outline block diagram at the time of enabling the communication link of the above-mentioned communication device in both directions.

[Drawing 3] It is an outline block diagram in case the communication link information on the above-mentioned communication device contains speech information or image information.

[Drawing 4] In the above-mentioned communication device, it is the outline block diagram showing the example which prepared the measurement section also in the receiving side.

[Drawing 5] In the above-mentioned communication device, it is the outline block

diagram showing the example which prepared the storage section which stores known information in the receiving side.

[Drawing 6] In the above-mentioned communication device, it is the outline block diagram showing the example which prepared the transceiver section with a third person in the receiving side.

[Drawing 7] In the above-mentioned communication device, it is the outline block diagram showing the example which prepared the storage section for every operator in the receiving side.

[Drawing 8] It is the outline block diagram showing the example which prepared the display in the above-mentioned communication device.

[Drawing 9] It is the explanatory view showing the example of a display in the display in the above-mentioned communication device.

[Drawing 10] It is the explanatory view showing other examples of a display in the display in the above-mentioned communication device.

[Drawing 11] It is the explanatory view showing the example of a display of further others in the display in the above-mentioned communication device.

[Drawing 12] It is the graph which shows the example of a display of further others in the display in the above-mentioned communication device.

[Drawing 13] It is the radar chart which shows the example of a display of further others in the display in the above-mentioned communication device.

[Drawing 14] It is the explanatory view showing the example of a display of further others in the display in the above-mentioned communication device.

[Drawing 15] In the above-mentioned communication device, it is the outline block diagram showing the example which prepared the display also in the transmitting side.

[Drawing 16] It is the outline block diagram showing the example which analyzes the speech information in the above-mentioned communication device.

[Drawing 17] It is the explanatory view showing the example of a display of further others in the display in the above-mentioned communication device.

[Drawing 18] In the above-mentioned communication device, it is the outline block diagram showing the example which prepared the biological information (physical information on environmental) processing section, and a display also in the transmitting side.

[Description of Notations]

11 Transmitting Section

12 Communication Link Information

13 Receive Section

14 Biological Information (Physical Information on Environmental) Processing Section (Presumed Section)